NO_2 modeling: Current status and plans for updates to Appendix W

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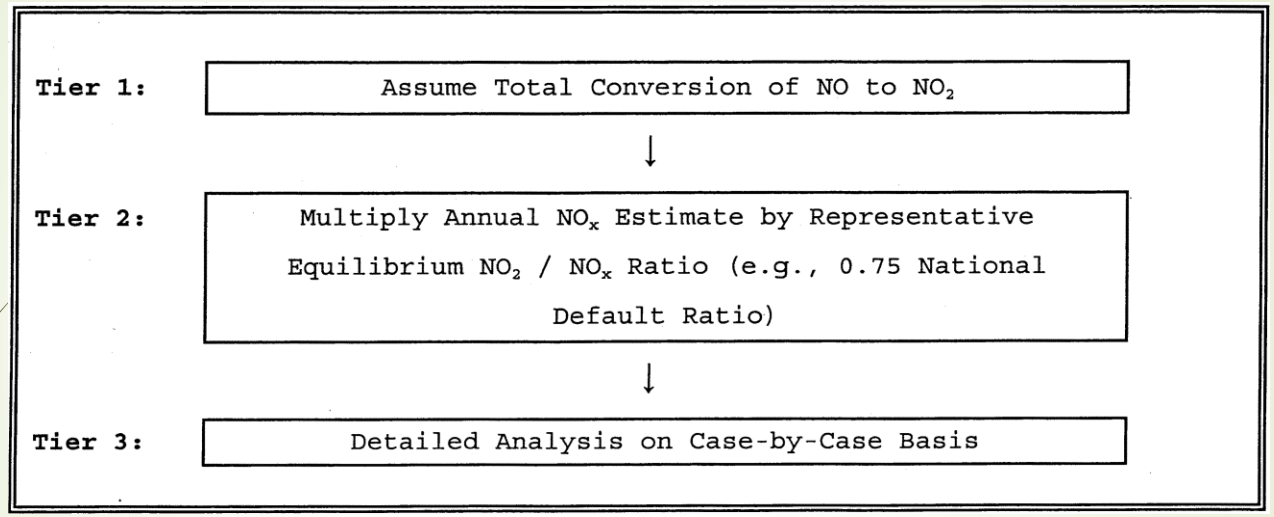
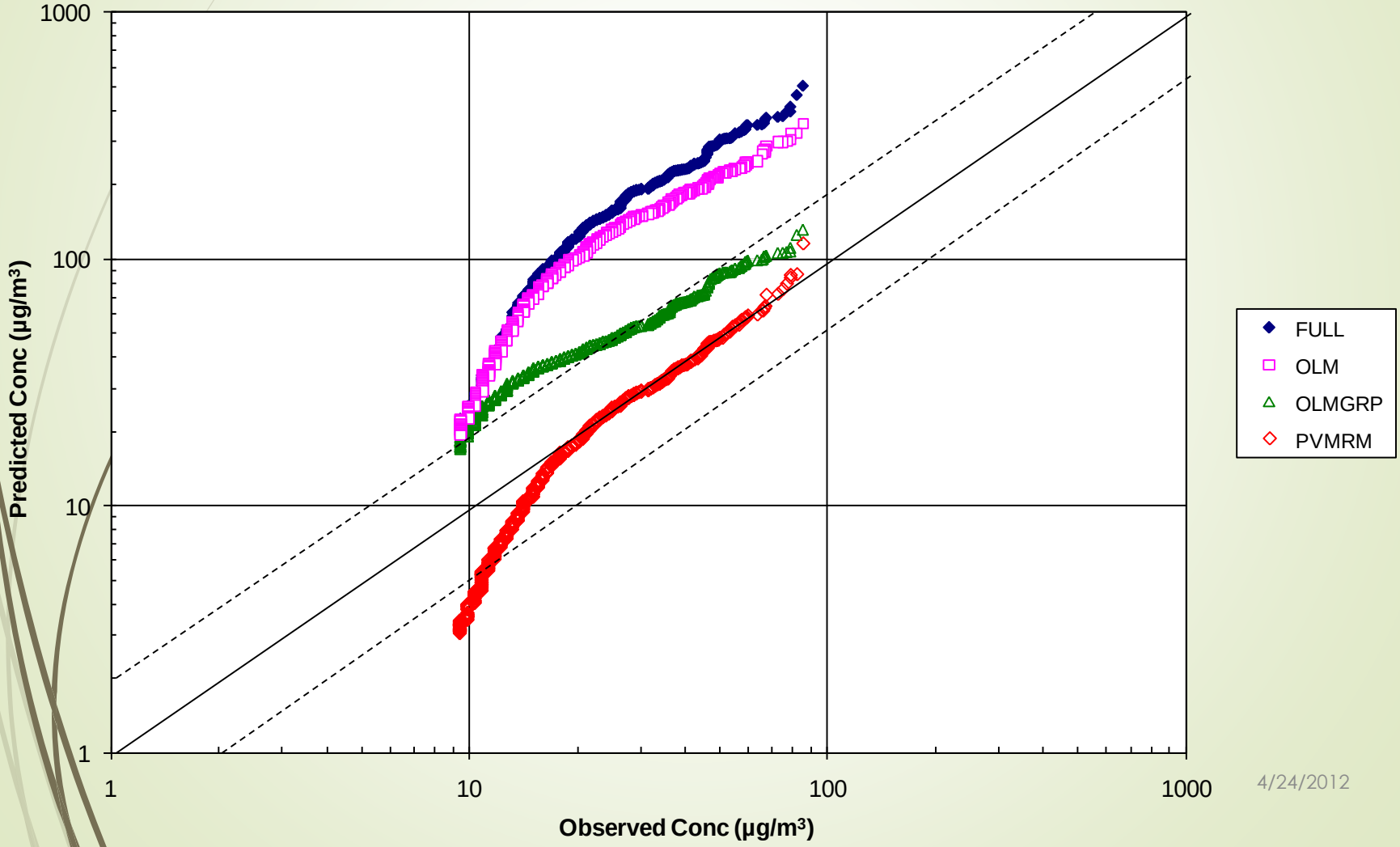
2014 EPA RSL Modelers' Workshop

Background - Multi-tiered NO2 screening



- Tier 2
  - The reviewing agency may establish an alternative default NO2/NOX ratio based on ambient annual average NO2 and annual average NOX data
- Tier 3
  - OLM listed as an option for point sources

Figure A-3. AERMOD Model Evaluation - Palaau, HI - Hourly NO2 Q-Q Plot



Plans and priorities

- Formally include ARM2 as Tier 2 method
- Formally adopt updates to OLM as Tier 3 method
- Formally adopt PVMRM as Tier 3 method
- Determine if OLM and/or PVMRM can be promulgated as refined modeling options for NO2 (i.e., not screening)
- Evaluate the role of the limited-chemistry version of SCICHEM in NSR/PSD permitting as a potential Tier 3 approach

Considerations

- NO2 modeling must consider chemistry
  - Co-pollutant, NO and NO2
  - Current NO2 monitors convert NO2 to NO
  - Chemistry driven by ozone
    - Different sets of daytime and nighttime reactions
  - Entrainment of ozone must be considered
- Evaluation databases have greater data needs than for passive tracers
  - Emissions of NO and NO2
  - Background measurements of NO, NO2 and ozone
  - Met should include solar radiation

Work plan

- Gather databases for evaluation
  - Stationary sources
    - Palaau, HI, Empire Abo, NM, Wainwright, AK (API)
    - Plant in LA, Region 6
    - Drill rig studies, AK and CO, summer 2014
  - Near-road
    - Las Vegas, Raleigh, Detroit (EPA's ORD)
  - Area-wide
    - Atlanta NO2 NAAQS Risk and Exposure Assessment (EPA OAQPS)
- Scenario assessments
  - Sensitivity and case studies to determine model performance outside of database scenarios
  - Past evaluations by AERMOD Implementation Workgroup (AIWG)
- Goal – to publish comprehensive review of AERMOD performance for ARM, ARM2, OLM, PVMRM using field databases

Current progress

- Workgroup consisting of OAQPS and key Regional Office staff
- Several workgroup meetings
  - Agreed on goals and workplan
  - Begun review of ARM2
  - Started review of field databases
  - On-going collaboration on summer 2014 field campaigns
- Updates to OLM and PVMRM
  - Addressed in upcoming NO2 memo

SCICHEM

- EPRI gave EPA presentation on newest version several weeks ago
- Version 3.0b2 – second version of the beta
  - "reduced chemistry" version – mimics AERMOD inputs. Only limited set of pollutants supported
  - "full chemistry" version – requires full 3-d fields of met & chemical fields (i.e., CMAQ output)
  - Still waiting on release of this version?
- Include reduced chemistry version in comprehensive review of model performance
- Document performance & provide feedback to EPRI

Questions?